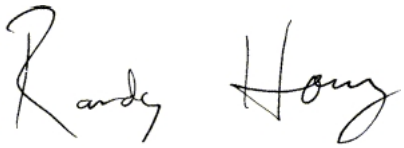
IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION

OLLIE GREENE, Individually as the Surviving Parent of WYNDELL GREENE, SR., et al.,	§	CASE NO.: 3:11-CV-00207-N
Plaintiffs,	§	
vs.	§	JURY TRIAL DEMANDED
TOYOTA MOTOR CORPORATION et al.,	§	
Defendants.	§	

DEFENDANT VOLVO GROUP NORTH AMERICA, LLC'S RESPONSE AND BRIEF IN OPPOSITION TO PLAINTIFFS' MOTION TO EXCLUDE THE REPORT AND TESTIMONY OF TIMOTHY CHEEK

Respectfully submitted,

HOWRY BREEN & HERMAN, LLP



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Defendant VOLVO GROUP NORTH AMERICA, LLC ("VGNA") files this response and brief in opposition to Plaintiffs' Motion to Exclude Report and Testimony of Timothy Cheek (Docket #493), respectfully showing:

I. INTRODUCTION

Plaintiffs have filed thirteen almost identical motions to exclude the expert testimony of every single defense expert in this case. In one of these boilerplate motions, they seek to exclude the report and testimony of Tim Cheek, an expert designated by VGNA to testify about the plaintiffs' "absent or defective collision warning system" and related theories of defect regarding the Volvo tractor. They seek exclusion on qualification, reliability and relevance grounds.

Unlike the plaintiffs' supposed collision warning system "expert" Keith Friedman, Mr. Cheek, who is a professional engineer, has over 20 years of real-world, hands-on experience with the design, testing, functionality and performance of collision warning systems – including, as discussed herein, the Eaton VORAD system – and heavy-truck radar and braking systems. He is highly qualified to offer expert testimony regarding such matters in this case.

Cheek's report and opinions also satisfy the reliability and relevance requirements of FRE 702 and *Daubert*. His opinions – including his opinion that a collision warning system (or adaptive cruise control or disc brakes) would not have affected the speed of the initial collision between the Volvo tractor and the 4Runner and, therefore, would not have changed the outcome of the accident for the Greene family – are based on the facts, data, and evidence of this case. They were formed using generally-accepted and scientifically-sound methods, principles and techniques and basic physics and math equations. Cheek's calculations regarding collision warning systems and disc brakes have never been refuted nor rebutted by Friedman, who performed no testing or calculations whatsoever in offering his purely *ipse dixit* opinions

regarding unspecified "radar systems" and brakes.

Plaintiffs' motion to exclude Cheek's report and testimony should be summarily denied.

II. BACKGROUND

A. The Collision and the Parties

This case arises from a multiple-vehicle collision on I-20 near Terrell, Texas, on May 28, 2010. The Greene family – Wyndell Sr., LaKeysha and their two young children, Wesleigh and Wyndell II – were riding in a Toyota 4Runner that had slowed or stopped because the traffic in front of them had stopped. The Greenes' 4Runner was struck from behind by a tractor-trailer that was traveling at highway speed. The 4Runner was first pushed into a Toyota Corolla, and then collided with the rear of another tractor-trailer. Five-year-old Wesleigh and two-year old Wyndell II died in the collision. LaKeysha was ejected from the passenger seat and also died in the collision. Wyndell Sr., who was driving, suffered burns and other injuries. He died about three months later.

The plaintiffs in this case are two relatives of the Greene family (Wyndell Sr.'s mother, Ollie Greene, and LaKeysha's mother, Marilyn Burdette Hardeman) and the administrator of Wyndell Sr.'s estate (Wyndell Sr.'s brother William Greene). Each of these three plaintiffs asserted a variety of claims and causes of action – primarily product liability claims – against five defendants in connection with the deaths of the members of the Greene family. These five defendants are: *(1)* Toyota, which made the 4Runner; *(2)* Volvo (VGNA), which made the tractor that struck the Greene vehicle; *(3)* Strick, which made the trailer that the Greene vehicle struck; *(4)* Dolphin, the owner of the trailer that the Greene vehicle struck; and *(5)* Fayard, the operator of the tractor-trailer that the Greene vehicle struck.

B. The Plaintiffs' Allegations Regarding the Volvo Tractor: What Has Been Pleaded and What Has ***Not*** Been Alleged.

The plaintiffs have pleaded three theories of "design, manufacturing and/or marketing defects" in the Volvo tractor: *(1)* "absent or defective collision warning system"; *(2)* "ineffective energy-absorption capabilities"; and *(3)* "the Tractor was defectively designed because it was incompatible, in a crash, with other vehicles on the road…". Plaintiffs' Second Am. Compl. (Docket #113) at ¶58. That is the extent of the detail in their pleadings vis-à-vis any alleged defects in the Volvo tractor.

Plaintiffs have not (and have never) pleaded or disclosed any specific proposed alternative design for any alleged defect. They have never pleaded any allegations of defect regarding the Volvo tractor's brakes or braking system.[1] They have never alleged any defect regarding "adaptive cruise control" or any "collision avoidance system."

C. Plaintiffs' Designation of Keith Friedman and Rhoads Stephenson; the Sketchy "Preliminary" Friedman Reports

Plaintiffs filed their notice of service of expert disclosures on November 20, 2013 – identifying "Keith Friedman and Dr. R Rhoades Stephenson, Friedman Research Corporation" as testifying experts. (Docket #244) The notice did not indicate what these or the other experts listed would testify about. On the same day, they served copies of their experts' reports – including one entitled "Greene vs. Volvo NA, et al. – Preliminary Crashworthiness Report" that was dated November 14, 2013. *See* Friedman Report, p. 1 (APP0069) The report was jointly signed by both Friedman and Stephenson. *See* Friedman Report, p. 35 (APP0103) It does not state who did what work, who reviewed or considered what materials, who was sponsoring which opinions, etc.[2] None of the "preliminary" Friedman reports have ever been supplemented

[1] *See generally* Plaintiffs' Original Complaint (Docket #1), First Amended Complaint (Docket #26) and Second Amended Complaint (Docket #113).

[2] It became clear in the course of the Friedman and Stephenson depositions that the plaintiffs are hoping to use Friedman as their jack-of-all-trades liability expert, and that Stephenson – a fire investigator – was

– either before or after the depositions were taken in January. Carlson Decl. at ¶2 (APP0416)

The "Discussion" section of the report contains subsections about "braking," "compatibility" and "radar"; there is no "energy-absorption" section. *See* Friedman Report, pp. 18-35 (APP0086-103) The "opinions" expressed in the Friedman report relating to "radar systems" are nothing more than generic or conclusory ("*ipse dixit*") statements. The report contains a one-paragraph discussion of the Eaton VORAD EVT-300 collision warning system (the "EVT-300 CWS") – *see* Friedman Report, p. 23 (APP0091) – a third-party (Eaton) designed and made collision warning system ("CWS") that was commercially available as an option on Volvo tractors at the time the subject tractor was made in January 2007. *See* Cheek Decl. at ¶11 (APP0004) It does not contain or refer to anything case-specific regarding the EVT-300 CWS (such as assumptions, distances, velocities, calculations, methodologies, diagrams, illustrations or results) or how it or any other CWS supposedly would have impacted this crash. Nothing was produced or disclosed with the report.

The report contains a single one-line reference to Adaptive Cruise Control ("ACC"), and does the same with Advanced Electronic Braking Systems ("AdvBS") *See* Friedman Report, p. 23 (APP0091) As with its EVT-300 CWS "discussion," the report contains absolutely nothing case-specific regarding either ACC or AdvBS (such as assumptions, distances, velocities, calculations, methodologies, diagrams, illustrations or results) or how either system, which are not "collision warning systems," would have made any difference at all in this crash. *Id.*; *See* Cheek Decl. at ¶¶16-17 (APP0005-06) The report does not include any statement that the subject tractor was unreasonably dangerous without any of these radar-based systems, and contains no risk-utility analyses. Friedman Report (APP0068-143)

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nothing more than an editor of the Freidman "Volvo report." *See* VGNA's Brief in Support of its Motion to Exclude Stephenson (Docket #461) at pp. 8-11.

D. VGNA's Designation of Timothy Cheek; Cheek's Report & Supplement Letter Report

VGNA designated/disclosed Tim Cheek on December 20, 2013, along with a copy of Mr. Cheek's written report, resumé, and list of recent testimony. *See* Cheek Report (APP0013-49); *see* Cheek Resumé (APP0057-0061). In his report, Cheek provided a detailed analysis of the performance and functionality of the EVT-300 CWS based on the manufacturer's specifications and literature, other technical literature and studies about the system, and his own empirical testing of the EVT-300 CWS, and then set forth his case-specific analysis. *See* Cheek Report, pp. 2-7 (APP0017-22) Using generally accepted methods and principles (discussed below) and the performance specifications set forth by the manufacturer, Eaton, Cheek performed calculations for several different scenarios that were within the range of speeds and distances determined by various accident reconstruction experts in this case. Cheek Report, pp. 6-7 (APP0021-22) In each instance, his calculations clearly demonstrated that the EVT-300 CWS would not have materially changed the speed of the initial collision between the Volvo tractor and the 4Runner and therefore would not have changed the outcome for the Greene family. *See id.* at pp. 5-7 (APP0020-22) He provided spreadsheets with his calculations, including the well-known and commonly-used mathematical equations he used, as an attachment to his report. *See id.* at Attachment D (APP0042-49)

Cheek also performed specific calculations showing that the use of disc brakes instead of drum brakes on the tractor also would have not materially affected the outcome of this crash. *See id.* at pp. 7-8 (APP0022-23) Again, he attached spreadsheets containing his calculations, including the well-known equations he used, as an exhibit to his report. *See id.* at Attachment D (APP0042-49) He also provided an additional detailed account of known and recognized limitations of the EVT-300 CWS specifically and CWS's in general – including extensive

references to published technical literature and an account of his own empirical testing of an exemplar EVT-300 CWS – and applied them to the facts and evidence of this case. *See id.* at pp. 8-11 (APP0023-26) Finally, he provided analyses of the economic feasibility of CWS's and disc brake systems, concluding (for different reasons) that it was not economically feasible for VGNA to include either a CWS or disc brakes as standard equipment on the subject vehicle at the time of manufacture in January 2007. *See id.* at pp. 10-11 (APP0025-26)

Friedman and Stephenson were both deposed in mid-January this year, a month after the defendants' expert designation deadline. Cheek prepared a supplemental letter report[3] that addressed several "surprise" matters that had not been disclosed or discussed in Friedman's report but came up in his deposition – including a newfound (but never-pled) theory that the Volvo tractor should have had adaptive cruise control. *See* Cheek Suppl. Report (APP0050-56)

Cheek was deposed on such matters on February 27, 2014; VGNA produced Cheek's entire file for this case to plaintiffs' counsel well before the deposition. Carlson Decl. at ¶3 (APP0416-417)

II. ARGUMENT AND AUTHORITIES

A. Mr. Cheek is qualified to give expert testimony and opinions in this matter in the areas for which he has provided opinions and testimony.

Plaintiffs have moved to exclude Mr. Cheek's report and testimony in their entirety on unspecified qualifications grounds. That argument is absurd – particularly when Cheek's qualifications are juxtaposed against Friedman's and Stephenson's.[4]

The law governing expert qualifications under FRE 702 and *Daubert* is well developed, and VGNA will not dwell on it here. Rule 702 requires that an expert be qualified by his or her

[3] Cheek's supplemental letter report is dated February 11, 2014 and was served on February 11, 2014.
[4] Because Dr. Stephenson has essentially acknowledged that he performed no work and has formed no opinions regarding radar systems or braking systems, VGNA will refer only to Mr. Friedman's testimony and opinions throughout this response.

knowledge, skill, experience, training and education such that his or her testimony will help the trier of fact. FED. R. EVID. 702; *see Wellogix, Inc. v. Accenture,* L.L.P., 716 F.3d 867, 881-82 (5th Cir. 1999) (discussing and applying expert qualification law under FRE 702 and *Daubert*).

Cheek has been retained and designated by VGNA to offer testimony regarding the plaintiffs' "absent or defective collision warning system" defect allegation (including any related allegations). He is also offering testimony regarding Friedman's conclusory and belated (November 20, 2013) assertion that "the Volvo tractor should have had a better braking system" – an opinion that is not relevant to any of the three alleged defects that the plaintiffs have actually pleaded in their complaint(s) in this case.

Cheek is well-qualified in terms of knowledge, skill, experience, training, education and credentials to offer expert testimony in each of these areas. Unlike Friedman, who testified that he worked on one "radar system" 30 to 40 years ago – *see* Friedman Depo Tr. at 232:11-234:24 (APP0352-353) – Cheek has specific, extensive and recent experience in the design, testing and performance of collision warning and adaptive cruise control systems. He also has extensive experience in heavy truck on-board computer systems, including the EVT-300 CWS and other similar CWS's, and the preservation, collection and interpretation of data from such systems.

Cheek has bachelor's (1991) and master's degrees (1993) in Materials Science and Engineering from the University of Florida. Cheek Decl. at ¶7 (APP0003) He is a Registered Professional Engineer in Florida, North Carolina, South Carolina and Alabama. *Id.* He has a Class A Commercial Driver's License, which qualifies him to operate commercial motor vehicles such as the Volvo tractor at issue in this case. *Id.*

Cheek has worked in the areas of forensic engineering and accident reconstruction since 1993. *Id.* at ¶8 (APP0003) He has attended accident reconstruction courses at Northwestern

University and Engineering Dynamics Corporation, and has reconstructed hundreds of motor vehicle crashes – most of which have involved tractor-trailers and other commercial motor vehicles. *Id.*

Cheek worked for Navistar, a manufacturer of medium- and heavy-duty trucks, buses and diesel engines, for seven years. *Id.* at ¶9 (APP0003) At Navistar, he worked in the areas of heavy truck testing, development, design, and accident investigation. *Id.* He was involved in design reviews regarding the implementation of collision warning systems on Navistar truck products. *Id.* at ¶9 (APP0003-04) He also performed design reviews of brake systems and brake sub-systems; tested heavy truck brake systems; and investigated collisions where brake system failures had been alleged. *Id.* at ¶9 (APP0004)

Cheek has been employed by DELTA [v] Forensic Engineering since 2005, where he is a Principal Engineer. *Id.* at ¶10 (APP0004) He has extensive experience in the collection, interpretation and analysis of data from heavy truck electronic control modules and data recorders ("ECM's" – sometimes referred to as "black boxes"), and has personally downloaded and analyzed ECM data from hundreds of heavy trucks of many makes and models. *Id.* He has personally investigated approximately 10 to 15 accidents in which his primary focus was on the data, function or performance of an EVT-300 CWS or a CWS similar to it; the majority of those investigations specifically involved the EVT-300 CWS. *Id.* at ¶12 (APP0004)

He is the co-creator and instructor of a Society of Automotive Engineers ("SAE") Professional Development Course titled "Accessing and Interpreting Heavy Vehicle Event Data Recorders" – a 3½ day course taught twice a year since December 2010 that includes a module entirely devoted to the Eaton VORAD CWS systems and which includes detailed instruction on how the EVT-300 CWS works, how it records data, and how to interpret that data. *Id.* at ¶13

(APP0004)

Cheek has been a member of the SAE Truck & Bus Active Safety Systems Committee (the "Committee") since October 2009, when it was first formed. Cheek Decl. at ¶14 (APP0004); Cheek Depo Tr. 28:22-29:10 (APP0347) The Committee is responsible for:

> [D]eveloping, reviewing, and approving SAE Recommended Practices, Standards, Draft Technical Reports, Technical Data Reports, and Information Reports related to all types of active safety systems and their interfacing with operators and other vehicle systems. Active safety systems include vehicle/operator warning systems (such as but not limited to lane departure, **collision warning**, pedestrian/object recognition systems) and proactive safety systems (such as but not limited to **adaptive cruise control**, pre-crash system actuation, collision mitigation systems, automatic system control systems but excluding antilock and stability control braking systems). **The committee will initially focus on vehicle/operator collision warning systems. Additionally, it will address collision warning systems, collision mitigation, and collision intervention systems in parallel.** Other active safety systems will be addressed when sufficient resources are available.

Cheek Decl. at ¶14 (APP0004-05) & Exhibit "1-E" thereto (APP067) (emphasis added)

The Committee is charged with developing standards pertaining to active safety systems, including CWS's and "collision mitigation systems." Cheek Decl. at ¶15 (APP0005) The primary focus of the Committee since its inception (which was after the subject Volvo tractor was manufactured) has been on CWS's and automatic braking systems. *Id.* It is currently in the process of developing performance requirements for testing of CWS's and automatic braking systems – identifying test protocols, criteria, conditions and minimum performance standards. *Id.* Essentially, the committee is designing the tests that CWS manufacturers and other original equipment manufacturers ("OEM's") will likely be testing to in the near future. *Id.* The ACC systems utilized the same radar system as a CWS (and are essentially an add on feature to CWS) and Mr. Cheek's experience is equally applicable to ACC. Cheek Decl. at ¶¶35 & 40 (APP0010-11)

In addition to all of the foregoing, as discussed in more detail below, prior to his retention

in this lawsuit Cheek also personally tested the same make and generation collision warning system – the EVT-300 CWS – that was on the market when the subject Volvo tractor was manufactured. *See* Cheek Decl. at ¶¶27-34 (APP0009-10) All of the underlying materials from his empirical testing – including videos of each run, notes on each run, and the test report from Eaton interpreting the data that was collected during the testing – were produced to plaintiffs' counsel well in advance of Cheek's deposition. *Id.* at ¶34 (APP0010); *see* Carlson Decl. at ¶3 (APP0416-417) Plaintiffs' counsel elected not to depose Cheek on these areas, and instead chose to make the specious argument that they were not permitted to attend and video the testing as grounds for its alleged inaccuracy. *See* Plaintiffs' Motion (Docket #493) at p. 15

Cheek's relevant, recent and extensive experience and expertise in these areas clearly qualify him to testify in this case.

B. Mr. Cheek's opinions are reliable and relevant under FRE 702 and *Daubert*.

If an expert is qualified, his or her opinions must satisfy the reliability and relevance requirements of FRE 702 and *Daubert*. *Daubert v. Merrill Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 591 (1993). Mr. Cheek's opinions plainly meet these requirements as well.

1. Mr. Cheek's report and testimony are reliable because he performed case-specific analyses employing generally accepted principles and methods and basic mathematical equations.

FRE 702 requires that: *(1)* the expert's testimony must be based on sufficient facts or data; *(2)* the expert's testimony must be the product of reliable principles and methods; and *(3)* the expert applied these principles and methods reliability to the facts of the case. *U.S. v. Conn*, 297 F.3d 548, 555 (7th Cir. 2002). Under *Daubert* and its progeny, the "reliability" analysis entails evaluating a number of potential factors: *(1)* whether the theory or technique underlying the expert's testimony can be or has been tested; *(2)* the technique's known or potential rate of error; *(3)* whether the theory or technique has been subjected to peer review and publication; *(4)*

whether the theory or technique has gained general acceptance in the relevant scientific community; *(5)* whether the expert's testimony is based on sufficient facts or data; and *(6)* whether the opinion was developed expressly for the purpose of testifying or as a result of independent research. *Daubert*, 509 U.S. at 593-94; *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 152 (1999); *Pipitone v. Biomatrix, Inc.*, 288 F.3d 239, 244 (5th Cir. 2002). These factors are neither exhaustive nor definitive, and are not each applicable in every case or instance. *U.S. v. Simmons*, 470 F.3d 1115, 1123 (5th Cir. 2006) (discussing and applying *Daubert* factors); *Black v. Toys-R-Us*, 2010 U.S. Dist. LEXIS 119460 *9 (S.D. Tex. Nov. 10, 2010) (same).

Mr. Cheek initially offered opinions in two basic subject areas:

(1) CWS – including whether the absence of a CWS made the subject vehicle defective; whether the presence of any available CWS, including the EVT-300 CWS, would have had any impact on the outcome of the subject accident; and whether it was economically feasible for VGNA to include a CWS as standard equipment on the subject tractor; and

(2) Disc Brakes/Electronically-Controlled Disc Brakes – Friedman's belated and unpleaded assertion that "the Volvo tractor should have had a better braking system" in the form of disc brakes instead of drum brakes.

After Friedman conveniently switched his alternative design from CWS to ACC in his deposition, Cheek immediately offered opinions on ACC – including whether the presence of any available ACC system, such as the Eaton VORAD SmartCruise system, would have had any impact on the outcome of the subject accident. These subjects are addressed below.

2. Mr. Cheek's testimony and opinions on collision warning systems and the EVT-300 CWS are reliable and he used the proper methodology.

Cheek's testimony and opinions regarding the EVT-300 CWS, and CWS's in general, are reliable. In his report, Cheek provided and included case-specific calculations on how the EVT-

300 CWS would have performed in this collision.[5] Cheek Report, pp. 5-7 (APP0020-22) & Attachment D thereto (APP0042-49) Contrary to Plaintiffs' incorrect allegations, his calculations are based on the performance specifications provided by the CWS manufacturer, Eaton, and are not altered based on his own testing. Cheek Decl. at ¶18 (APP0006) His report included the equations he used to calculate the speeds and distances of the vehicles. *See* Cheek Report, Attachment D (APP0043-47) These equations are universally used in accident reconstructions and can be found in the most commonly-referenced accident reconstruction texts, including the *Northwestern Accident Reconstruction Manual*. Cheek Decl. at ¶18-19 (APP0006-07) Cheek's calculations used generally accepted methods and mathematical formulas that could have been tested by the plaintiffs' experts, although they have apparently not done so for the purposes of the plaintiffs' motion to exclude. *Id.* at ¶20-21 (APP0007) Moreover, these calculations are based on relevant and sufficient data and facts: they use the performance specifications provided by the CWS manufacturer, Eaton, and were applied to the vehicle speeds and deceleration rates determined by reconstruction experts in this case. *Id.* at ¶18 (APP0006)

Cheek's calculations are completely consistent with technical research that has been published regarding collision warning systems in general and the EVT-300 CWS in particular. Cheek Decl. at ¶19 (APP0006-07) & Exhibit "1-G" thereto (APP0144-238)

In addition to the calculations he performed based on Eaton's specifications, Cheek conducted his own empirical testing to determine if the EVT-300 CWS would function as claimed. Cheek Decl. at ¶27-34 (APP0009-10) He purchased a new EVT-300 CWS and installed it on a truck following the procedures provided by Eaton. *Id.* at ¶28 (APP0009) He aligned the radar antenna and calibrated the system following the recommended procedures from Eaton and by using the Eaton RoadRanger PC diagnostic software. *Id.* at ¶29 (APP0009) After

[5] The plaintiffs' experts have not refuted these calculations.

successfully installing, aiming and calibrating the system, he tested the radar detection against both a passenger vehicle (a Mazda CX-5 SUV) and a soft target (an extra-large cardboard box covered in aluminum foil) to confirm that there was no difference in the detection distance when using either the soft target or the passenger vehicle as a target.[6] *Id.* at ¶30 (APP0009) He empirically tested the collision warning "alert" function by driving in a straight line toward the stationary soft target at various speeds up to 55 mph. *Id.* at ¶31 (APP0009) The response of the collision warning system was captured via video within the cab of the truck, and the speed and position of the truck was documented using a Video VBOX-Lite (a video, GPS, data-logging system manufactured by Racelogic), which is commonly used and well-accepted in the testing of motor vehicles. *Id.* He sent the EVT-300 CWS Central Processing Unit (CPU) to Bendix (the successor to Eaton) for extraction of the data recorded by the CPU. *Id.* at ¶32 (APP0009-10) He then analyzed and compared the results of the data report provided by Bendix with the data documented by video during the testing. *Id.*

Cheek also tested the functionality and response of the EVT-300 CWS during general driving on interstate highways, and again documented his testing via video. *Id.* at ¶33 (APP0010) These general driving events involved gradually approaching a slower vehicle in the general flow of traffic, and following a vehicle that was accelerating away from the test truck. *Id.* The testing was performed in accordance with the specifications from Eaton and was consistent with testing that was reported in technical literature. *Id.*

Unlike Friedman – who performed no CWS or "radar" calculations and did no testing at all, but instead simply parroted a few sentences from the manufacturer's specifications (and, then, got that wrong) and offered an *ipse dixit* opinion – what Mr. Cheek has done is exactly

[6] The use of a soft target for purposes of the testing was chosen for safety purposes. Cheek's use of an aluminum covered cardboard box was consistent with accepted methodology employed in other studies. *See* Cheek Decl. at ¶30 (APP0009) and Exhibit "G" thereto (APP0171 & 178)

what *Daubert* contemplates to demonstrate reliability. The potential rate of error was extremely low and was essentially limited to failure or malfunction of the data recording devices (which were calibrated) or video recorders. Cheek's test was set up in the same manner as testing run in published technical studies. Cheek Decl. at ¶27 (APP0009) And, all of the underlying materials for Cheek's calculations and test, including the test report, were produced to the plaintiffs' well in advance of Cheek's deposition. *Id.* at ¶34 (APP0010)

The only specific arguments that the plaintiffs make regarding the reliability of Cheek's EVT-300 CWS and CWS opinions are that: *(i)* he does not use a distance of 500 feet for the radar system's range; and *(ii)* he did not use the Insurance Institute for Highway Safety's "practiced methodology" of conducting a "statistically significant survey" to determine the impact of collision warning systems in general. *See* Plaintiffs' Motion to Exclude (Docket #493) at p. 14. The former is a glaring misrepresentation of the performance capability of the EVT-300 CWS and highlights Friedman's colossal lack of understanding of (and lack of qualifications regarding) the EVT-300 CWS in particular and collision warning systems in general. The latter is completely inapplicable to the accident at issue and should be summarily disregarded.

In his report, Cheek provided a detailed description of how the EVT-300 CWS works, and included a detailed explanation – complete with excerpts, charts and illustrations – of how the EVT-300 CWS calculates the maximum range of the antennae and therefore the maximum distance at which a "detection alert" (a yellow light) will illuminate: 350 feet. Cheek Report., p. 5 (APP0020) In response (and demonstrative of their apparent lack of understanding of how the system works), Plaintiffs point to one sentence from the Eaton materials that states that the radar *monitors* "up to 500 feet" in an attempt to superficially attack Mr. Cheek's methodology and mislead the Court regarding how the system works. Plaintiffs' Motion to Exclude (Docket #493)

at p. 14. The following excerpt from Mr. Cheek's declaration in support of this response (which is consistent with his description on pages 5-6 of his report) demonstrates the distinction between various 500-foot, 350-foot and 220-foot "ranges" of the EVT-300 CWS system:

> The plaintiffs in this case have contended that I used the incorrect detection distance of the VORAD EVT-300 CWS of 350 feet as opposed to 500 feet – but that contention is based on their own misunderstanding because a radar antenna's "operating range" and a collision alert system's "detection range" are two very different things. The radar operating range for the forward-looking radar antenna that was incorporated into the VORAD EVT-300 CWS has been listed as up to 500 feet. Roadranger Service Training, Eaton VORAD Collision Warning System RRSG-3180, p. 1-3 [(APP00247)]. A true and correct copy of excerpts from this publication is attached as Exhibit "1-H." However, the radiated range of the radar antenna is not the same thing as the tracking and alert distances within the VORAD EVT-300 CWS. The specifications for the VORAD EVT-300 CWS are that it will track or monitor up to 20 objects within a range of 350 feet. VORAD EVT-300 Installation Guide VOIG0030, p. 3 [(APP0266)]; Roadranger Service Training, Eaton VORAD Collision Warning System RRSG-3180, p. 2-1 [(APP0256)]; EVT-300 Driver Instructions VODR0030, p. 5 [(APP0275)]. True and correct copies of excerpts of these three publications are attached as Exhibit "1-I," Exhibit "1-H" and Exhibit "1-J" respectively.
>
> The detection alert range of the radar beam emitted by the front antenna of the VORAD EVT-300 CWS is limited to a certain distance. The system is constantly comparing two variables against one another to determine the maximum range of the antenna. Based on this design, the farthest distance that the front antenna will ever *detect* an object will be the smaller of either 350 feet or 2 x (Sin (6 deg)) x Turn Radius. Roadranger Service Training, Eaton VORAD Collision Warning System RRSG-3180, p. 3-1 (Exhibit "1-H"**)** [(APP0259)]. In other words, the maximum range of the forward-looking radar antenna is limited in practice to a distance of 350 feet (maximum) by the software algorithm within the VORAD EVT-300 CWS's Central Processing Unit (CPU). Therefore, any response of the VORAD EVT-300 CWS is limited to a maximum range of 350 feet and, depending on the conditions, may be much less than that.
>
> In the "Characterization Testing and Analysis of a Commercial Vehicle Front and Side Collision Warning System and Adaptive Cruise Control, DOT-VNTSC-NHTSA-01-01, Final Report" (Bates-labeled VGNA 004024-117) [(APP0144-238)] report, testing of the forward radar profile showed an average of 432 feet and a maximum of 438 feet. These test results were a measure of the operating range of the radar antenna and would be comparative to the listing of 500 feet forward radiated range of the VORAD EVT-300 CWS radar antenna as listed in Exhibit 13 to my deposition, true and correct copy of excerpts from same are attached as Exhibit "1-K" to this declaration. [(APP0278-281)] In my own empirical testing of a VORAD EVT-300 CWS, the maximum forward range of the radar was 361 feet. Again, this distance should not be confused with the "Range_max" utilized by the Collision Warning System Algorithm, which is limited to 350 feet or less, and forms the basis for the maximum detection range provided by the

> system.
>
> The VORAD EVT-300 CWS will not issue any driver alert or response at any distances greater than 350 feet. Its "Alert Algorithm" is designed such that it will issue an "Object Detected" alert at a maximum range of 350 feet when the host truck is closing on an object ahead. Exhibit "1-G" **(**VGNA 004056) [(APP0177)]; Exhibit "1-J", EVT-300 Driver Instructions VODR0030, p. 12 [(APP0276)]. The "Object Detected" alert is an illumination of a yellow lamp on the driver display unit ("DDU"). There is no audible tone issued with the "Object Detected" alert. A "Stationary Object Alert" or "Slow Moving Object Alert" will be issued when the range is within 220 feet or the headway (range/closing speed) is within 3 seconds. In other words, the maximum distance at which a "Stationary Object Alert" or "Slow Moving Object Alert" will be issued is 220 feet. On VGNA 004059, tests of the VORAD EVT-300 CWS showed that a "Stationary Object Alert" was issued at distances of 214 to 220 feet when the host truck was approaching the stopped object at a speed of 60 mph. Exhibit "1-G" (VGNA 004059) [(APP0180)]. Results for the "Slow Moving Vehicle Alert" were similar. Exhibit "1-G" (VGNA 004074) [(APP0195)].
>
> In some cases during the testing reported in "Characterization Testing and Analysis of a Commercial Vehicle Front and Side Collision Warning System and Adaptive Cruise Control, DOT-VNTSC-NHTSA-01-01, Final Report" (VGNA 004024-117) [(APP0144-238)], wherein the host truck was driven toward a stopped vehicle, the alert distances were much less than specified 220 feet. In these tests, the VORAD EVT-300 CWS had sensed the stopped vehicle, but did not issue a driver alert at the specified range but rather at distances as low as 98 feet. Exhibit "1-G" (VGNA 004060-61) [(APP0181-82)]. The authors of the report determined that the likely cause of this late alert was that the VORAD unit interpreted the stopped vehicle as a non-threat – i.e., a vehicle out of the path of the subject vehicle – when, in fact, the stopped vehicle was directly in the path (in the same lane) of the host tractor. Regardless, the specified <u>detection range</u> of the VORAD EVT-300 CWS is 350 feet and the <u>audible alert range</u> for a slow-moving or stopped vehicle is 220 feet or less..

Cheek Decl. at ¶¶22-26 (APP0007-08)

Friedman incorrectly stated in his deposition that any distinction between 300[7] and 500 feet isn't critical for this system and the system isn't dependent on those numbers, Friedman Depo Tr. at 665:18-666:14 (APP0364), whereas Cheek used the correct maximum "detection range" of 350 feet in his analysis. The bottom line is that the plaintiffs and their CWS "expert" simply don't understand how the system actually works. That is certainly no reason to exclude

[7] Friedman additionally uses a lesser (albeit incorrect) distance of 300 feet in his report. Friedman Report, pg. 23 (APP0091).

Mr. Cheek.

With regard to the plaintiffs' claim that Cheek did not use the Insurance Institute for Highway Safety's "practiced methodology," that methodology is completely irrelevant to any claims at issue in this case. The "methodology" of the IIHS survey does not provide a methodology of determining how any specific collision warning system would perform in any given situation. Cheek Decl. at ¶¶38 (APP0010-11); *see also* Exhibit "4" (APP0365-74)[8] More specifically, it does not provide a methodology for how the EVT-300 CWS would have performed in this accident. *Id.* Rather, it is a method for analyzing crash statistics to determine the impact of certain safety systems – including collision warning systems – if every vehicle in every recorded accident in its databases were equipped with the specified safety systems. *Id.*[9]

3. Mr. Cheek's testimony and opinions on collision warning systems and the EVT-300 CWS are relevant.

Cheek's testimony regarding collision warning systems and the EVT-300 CWS is clearly relevant. The plaintiffs have alleged that the Volvo tractor was defective due to an "absent or defective collision warning system." Plaintiffs' Second Am. Compl. (Docket #113) at ¶58. Since there was no CWS on the subject tractor, the only basis for their defect claim is the "absence" of one. Under Texas law, they must plead and prove that there was an alternative design that would have prevented or significantly reduced the risk of the Greene family's injuries or deaths and was both technologically and economically feasible at the time at the time the subject vehicle left VGNA's control in January 2007. TEX. CIV. PRAC. & REM. CODE §82.005. The only CWS even discussed by Friedman (in his deposition, but not his report) as available to be installed on the

[8] Jermakian, J., *Crash Avoidance Potential of Four Large Truck Technologies,* Accident Analysis and Prevention 49 (2012), pp. 338-46.

[9] *see also* Jermakian at 338 ("The objective of this paper was to *estimate* the maximum potential large truck crash reductions in the United States associated with each of four crash avoidance technologies…")(APP0366).

subject tractor was the Eaton EVT-300 CWS. Friedman Depo Tr., pp. 324:1-14 & 390:7-18 (APP0358 & 0363) It was in fact optional equipment and offered by VGNA at that time, but the purchaser of the truck, Forest Products, chose not to purchase it. Cheek Report, p. 1 (APP0016) Cheek's uncontested testimony and supporting calculations demonstrating that the EVT-300 CWS would not have changed the outcome of this incident go to the very core of the plaintiffs' claim. The only possible reason his testimony would be irrelevant is if the Court either grants summary judgment on the CWS claim (as it should) or excludes Friedman's CWS and "radar" testimony (as it should).

4. Mr. Cheek's opinion and testimony regarding the economic feasibility of CWS is both relevant and reliable.

The plaintiffs are asking the Court to exclude Cheek's testimony that making CWS standard on VGNA vehicles was not economically feasible because: *(1)* he was not aware of any cost-benefit analysis performed by VGNA; and (2) plaintiffs' counsel presented him with supposedly "undisputed" evidence that "most drivers prefer to drive trucks that are equipped with collision warning systems" and are "enthusiastic" about adaptive cruise control. *See* Plaintiffs' Motion to Exclude (Docket #493) at p. 11-13.

The first argument is irrelevant and an attempt to circumvent the actual sub-part of the question that will be asked of the jury: was CWS economically feasible as a standard feature at the time the subject tractor was manufactured and left VGNA's possession in January 2007? *See* TEX. CIV. PRAC. & REM. CODE §82.005. Whether VGNA did not perform any analysis has nothing to do with whether or not to exclude Cheek's testimony. Cheek performed his own cost-benefit analysis based on published literature and costs identified by VGNA. Cheek Report, pp. 10-11 & 13 (APP0025-26 & APP0028); Cheek Decl. at ¶39 (APP0011) He determined the wholesale cost of the EVT-300 CWS to VGNA (through documentation provided in discovery)

to be not less than approximately $2,000 for the hardware alone. Cheek Report, p. 11 (APP0026); Cheek Decl. at ¶39 (APP0011) The actual cost to VGNA would have been higher. *Id.* However, as Cheek noted, in surveys both OEM's (truck manufacturers) and carriers (trucking companies) reported that the cost would need to be $1,000 or less in order for CWS to penetrate the market. Cheek Report, p. 11 (APP0026); Cheek Decl. at ¶39 (APP0011); *see* Exhibit "1-L" (APP0282-338)[10] Because the cost of the system was higher than the research showed the market could bear, Cheek concluded that it was not economically feasible to incorporate the EVT-300 CWS as standard equipment on the subject vehicle. Cheek Report, p. 13 (APP0028); Cheek Decl. at ¶39 (APP0011) Cheek's analysis was rooted in facts and data.

Cheek's opinion that the EVT-300 ACC was not economically feasible as standard equipment at the time of manufacture is also reliable. EVT-300 ACC or "SmartCruise" was not available as a stand-alone feature at the time the subject tractor was manufactured; instead, it was only available as an add-on to the EVT-300 CWS from Eaton at an additional cost of approximately $300. Cheek Decl. at ¶40 (APP0011) Cheek has opined that because the CWS itself was not economically feasible, the increased cost of ACC made the system even more expensive and therefore even less economically feasible. *Id.*

Plaintiffs' claim that surveys on driver "acceptance" and "enthusiasm" somehow negates Cheek's actual economic analysis – and thus warrants exclusion – is also flawed. Neither the deposition testimony referenced in Plaintiffs' motion nor the underlying NHTSA report discuss actual costs of the systems or what prices the purchasers of the trucks (primarily trucking companies) would actually pay. Instead, they simply reference surveys of how drivers reacted to the technology, whether they preferred to use a vehicle with the technology, and would purchase

[10] Ball, David, et al., *Factors in Decisions to Make, Purchase, and Use On-board Safety Technologies,* Report No. FMCSA-MCRT-06-003, Washington, D.C.: Federal Motor Carrier Safety Administration, Office of Research and Analysis (December 2005)

a vehicle with the technology. *See* Exhibit "5" (APP0375-386)[11] Whether drivers "prefer" or are "enthusiastic" about certain safety features does not mean that they or their employers are willing or able to *pay* for them. Plaintiffs' references do not in any way demonstrate any economic analysis or economic feasibility study regarding either CWS or ACC.

5. The VS-400 is irrelevant to this lawsuit. If, however, for any reason Plaintiffs are allowed to introduce evidence on the VS-400, Mr. Cheek should be given the opportunity to rebut any such evidence and his opinions on the VS-400 ACC will be relevant.

The VS-400 is irrelevant to this lawsuit and no party should be offering evidence or testimony on this newer-generation system. Like the EVT-300, this system was not designed or manufactured by VGNA, but instead by a third-party supplier, Eaton (which was subsequently purchased by Bendix). Cheek Decl. at ¶37 (APP0010) The VS-400 was the model of CWS and ACC that replaced the EVT-300 model, and was not commercially available at the time the subject tractor was made and sold and is therefore factually and legally irrelevant to these claims. *Id.*

Even if the Court were to somehow determine that a system that was not even in existence and was not commercially available at the time of manufacture was relevant, neither the plaintiffs nor Friedman have ever identified the VS-400 as a safer alternative design. Friedman never even mentioned the VS-400 in his report. *See* Friedman Report (APP0068-143) Cheek thus had no reason to address the VS-400 in his own report. Moreover, the only time the VS-400 was ever mentioned in Friedman's January 2014 deposition was merely in passing when he stumbled across a VS-400 brochure in his notebooks (which had never been produced to or seen by counsel for VGNA) while trying to answer a question about disc brakes. Friedman Depo Tr. at 353:4-354:10 (APP0362) He admitted that he had no idea whether the VS-400 was

[11] National Transportation Safety Board, *Special Investigation Report: Vehicle- and Infrastructure Based Technology for the Prevention of Rear-End Collisions*, PB2001-917003, Notation 7356 (2001)

available at the time the subject tractor was manufactured in January 2007, and then moved on to answer the question regarding disc brakes. *Id.* He made no statements in his report, in his deposition, or otherwise that proposed the VS-400 as an alternative design or that the VS-400 would have made any difference in this crash. In fact, the literature he referenced in his deposition specifically identifies and discusses the EVT-300 model. *Id.* at 324:1-14 & 390:7-18 (APP0358 & APP0363)

For the foregoing reasons, no evidence pertaining to the VS-400 should be allowed in front of the jury. If, however, for any reason the Court allows Friedman to offer testimony on the irrelevant and previously undisclosed VS-400 as an alternative design (it should not), then Cheek should be allowed to rebut any such testimony.

6. If the Court allows Friedman's surprise ACC theory and testimony, Mr. Cheek's testimony on the EVT-300 ACC and ACC's in general is reliable and relevant.

Plaintiffs are asking the Court to exclude Cheek's supplemental report and testimony regarding adaptive cruise control because he did not provide a written "response" or acceptable methodology on the use of adaptive cruise control in his original (December 20, 2013) report but later – after Friedman's deposition on January 15 & 17, 2014 but well before Cheek's own deposition on February 27, 2014 – provided the supplemented letter report in which he rebutted Friedman's surprise "ACC" theory. *See* Plaintiffs' Motion to Exclude (Docket #493) at p. 16; *see* Cheek Decl. at ¶17 (APP0005-6); *see* Cheek Suppl. Report, pp. 4-5 (APP0054-55) This argument is preposterous, and in fact underscores VGNA's argument that Friedman's testimony on ACC (among other things) should be excluded.

ACC is not a "collision warning system." Cheek Decl. at ¶17 (APP0006) Plaintiffs have never pleaded the absence of ACC as an alleged defect in the subject tractor. *See* Plaintiffs' Second Am. Compl. (Docket #113) at ¶58. In fact, the phrase "adaptive cruise control" and

acronym "ACC" were never even mentioned by the plaintiffs or their experts in this case until Friedman's report was served on November 20, 2013 – and, even then, there was one single-sentence reference to ACC in the report. Friedman Report, p. 23 (APP0091)

More specifically, in his report Friedman did not make any allegation that ACC would have prevented or changed the outcome of this accident, nor did he specify any make or model of ACC as a safer alternative design, include any ACC-related analysis or calculations, or provide any ACC-related risk-utility analysis. *See id.* Rather, on page 23 of the report Friedman simply generically identified three "levels of sophistication and performance enhancement" as Collision Warning System (CWS), Adaptive Cruise Control (ACC), and advanced electronic Braking System (AdvBS). *Id.* at 23 (APP0091) Outside of this passing reference, the phrase "adaptive cruise control" and the acronym "ACC" do not appear anywhere else in the Friedman Report. *See generally id.*; *see* Cheek Decl. at ¶17 (APP0005-06) The Friedman Report ultimately makes a generic and conclusory statement on page 33 that "radar systems" would have affected the outcome of this accident, without providing any calculations or support or even mentioning ACC. Friedman Report, p. 33 (APP0101) Based on the absence of any discussion or calculations relating to ACC or any related pleadings, VGNA and Mr. Cheek reasonably understood that any generic references to "radar systems" (although not supported with any analysis or calculations) related to "collision warning systems," *i.e.*, the only alleged radar system-related defect ever pleaded in any complaint. Cheek Decl. at ¶17 (APP0005-06)

For the foregoing reasons, Freidman's testimony and opinions regarding ACC should be excluded, and no party or expert should offer any evidence or testimony regarding ACC. If, however, for any reason the Court allows Friedman to give testimony on his surprise alternative design, Cheek should be allowed to provide his rebuttal testimony as reflected his supplemental

letter report that set forth, *inter alia*, opinions regarding ACC and its lack of effect on the outcome of this collision. Cheek Suppl. Report, pp. 4-5 (APP0054-55) Those opinions are consistent with all of the relevant literature that clearly states that ACC is not intended to prevent or warn about a collision when the host vehicle is approaching a stopped or slow moving lead vehicle at high speeds. Cheek Decl., ¶¶35-36 (APP 0010) & Exhibit "1-G" thereto, pp. 57-60 (APP0215-18); *see also* Exhibit "1-J", p. 22 (APP0272) ("Smartcruise will not react to stationary objects and cannot bring the vehicle to a complete stop")

Cheek's opinions regarding ACC are reliable because they are based on, and consistent with, published studies and empirical testing of ACC.

7. No expert should offer testimony on "disc versus drum" brakes because there has never been a pleading of defective brakes. If, however, Plaintiffs are allowed to offer any such opinions, Mr. Cheek's opinions and testimony on disc brakes and advanced electronic braking systems are both relevant and reliable.

Cheek's opinions and observations regarding the "disc-versus-drum brake" issue *should be* irrelevant because: *(1)* there is not, and never has been, any pleading by the plaintiffs alleging that the Volvo tractor's brakes are defective; and *(2)* Friedman does not even opine that the brakes were defective or unreasonably dangerous (and instead baldly asserts that "the Volvo tractor should have had a ***better*** braking system"). *See* Friedman Report, p. 22 at ¶1 (APP0090) (emphasis added) As with his other opinions, Friedman did not provide or perform anything specific to the facts of this case regarding brakes or brake systems – whether disc or drum -- but instead simply summarized some results of a test that was not performed in connection with this case or this collision. *See id.* No expert should be allowed to opine about any purported (but unpleaded) defect or deficiency in the tractor's brakes or braking system; however, Cheek's opinions and observations regarding brakes are relevant unless and until any such testimony or evidence from Friedman is stricken and/or excluded.

Cheek addressed Friedman's brake comment in his own report. In Cheek's braking analysis, which is contained on pages 7 & 8 of his report, he used methods, principles and equations that are widely and commonly used in connection with crash investigations and reconstructions – using the actual vehicle weights of the subject vehicle (including a similarly loaded tractor-trailer) and well-accepted deceleration rates for both drum and disc brakes. Cheek Report, pp. 7-8 (APP0022-23) & Attachment D thereto (APP0042-49); Cheek Decl. at ¶42-43 (APP0012) He used the same 12% improvement in braking distance for disc brakes for a tractor only (without a loaded trailer) identified by Friedman. *Id.* He then performed calculations to account for a loaded trailer (which Friedman failed to account for) with drum brakes similar to the trailer at issue in this case. *Id.* His calculations, including the formulas he used, were included with his report. *Id.*; Cheek Report, p. 7-8 (APP0022-23) & Attachment D thereto (APP0042-49) Using three different scenarios, he determined that the only change in the speed of the Volvo tractor at it initial impact with the 4Runner in this accident if it had new disc brakes (as opposed to new drum brakes) would be an insignificant 1 to 2 mile per hour reduction in speed. Cheek Report, p. 8 (APP0023); Cheek Decl. at ¶42 (APP0012) He also noted that this did not take into account published research that shows that the increased braking distance advantage of disc brakes decreases as the brakes wear. *Id.* Because the subject vehicle's brakes were well-worn, he further noted, the potential reduction in impact speed due to disc brakes would have been even less than his calculations. *Id.*

Cheek's methods and equations for his braking calculations were in accord with the laws of physics and are identical to those used by virtually all accident reconstructionists in determining the braking capacity of a vehicle; they are referenced in numerous accident reconstruction texts, including the widely-accepted *Northwestern Reconstruction Manual*. *Id.* at

¶42-43 (APP0012)

Cheek's opinion that advanced electronic disc brakes ("brake by wire") are not economically feasible because the federal government requires manufacturers to include a redundant – and thus expensive – air brake system are also relevant and reliable. Cheek Report, pp. 11 & 13 (APP0026 & 28); Cheek Decl., ¶44(APP0012)

8. Mr. Cheek is not "interpreting" regulations or offering legal conclusions, and his opinions relying on facts typically relied upon by experts and related to his opinions in this matter are admissible, relevant and reliable.

Most, if not all, of the plaintiffs' thirteen motions to exclude various experts (of all of the defendants) include a vague cut-and-paste section objecting to or attempting to preclude VGNA's (and other defendants') alleged use of various experts to "interpret the law," "interpret legal issues," or state "conclusions to questions the jury will decide at trial." As to their motion to exclude Cheek, these vague and multifarious "objections" can be found at pages 5 through 7 of that motion. *See* Plaintiffs' Motion to Exclude (Docket #493) at pp. 5-7.

Rather than waste the Court's time rehearsing here *ad nauseam* what VGNA has fully briefed elsewhere, VGNA would refer the Court to VGNA's Response and Brief to the Motion to Exclude Stephen Werner at pages 19-23 wherein VGNA discusses in detail the law as to what is proper under FRE 704(a). Cheek's opinions are proper under FRE 704(a) and 403.

III. CONCLUSION AND PRAYER

Tim Cheek is qualified to give expert testimony and opinions on collision warning systems, adaptive cruise control, advanced electronic braking systems, disc brakes and any other related matters. His report, testimony and evidence is otherwise reliable and relevant. The motion to exclude should be denied in its entirety.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I do hereby certify that on April 7, 2014, a true and correct copy of the above and foregoing was forwarded to all counsel of record in accordance with the Federal Rules of Civil Procedure by electronic service through the court's ECF system in compliance with Federal Rules of Civil Procedure 5(b)(2)(E) and 5(b)(3).

Randy Howry